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EDITED BY WILLIAM HUNTING, F.R.C.V.S.

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PLEURO-PNEUMONIA.

By the courtesy of the Editor of *The Quarterly Journal of Comparative Pathology* we are enabled to offer our readers this week a full report of the lecture given by Professor McFadyean to the Lancashire and North of England V.M.A. Upon the substance of the paper we offer no comment—we simply desire that it should be carefully read. It is difficult to understand how any member of our profession can be indifferent to the truth of what is and what is not pleuro-pneumonia. If our teachers and experts cannot determine between a contagious lung disease and the appearances accompanying a non-contagious pulmonary affection, we ought clearly to know our ignorance. If there is no distinction then we shall logically treat all foreign animals arriving at our ports as suspect when their lungs at all simulate 'pleuro'—we shall be on the right side. If, however, there are distinctions which enable our experts to distinguish contagious from non-contagious lung changes we may be able to conduct our import trade upon easier lines.

The Deptford ox which has given such practical importance to this subject will have been a useful animal if it be the innocent cause of our profession making a decided step forward in pathological accuracy. The lung of the Deptford ox presented certain conditions which led Professors Brown, Duguid, Walley and McFadyean and Mr. Cope to say that the disease was contagious pleuro-pneumonia; but the same appearances caused an American veterinarian—Dr. Wray—to say they were decidedly not pleuro-pneumonia, and with his opinion agree Professors Williams and Bowhill.

During the past summer Professor McFadyean personally submitted portions of the lungs of this animal to Professors Bang, Schütz, Johne, Csokor, Kitt and Lüpke, and "each of these distinguished pathologists without hesitation declared that the lesions present were those of contagious pleuro-pneumonia."

Probably we shall get at the truth some day, and meantime we have had one side of the question fully and openly stated, whereas the other has only been promised two or three times. We certainly have given all the prominence we could to the subject, and our only object has been to fix the truth. One individual thinks we have been "very unfair." We cannot prevent him thinking so but we may ask him—why? Should he condescend to explain perhaps he will "verify his quotations" so that there may be no doubt that he bases his accusation upon something we have really written.

All that we can do now is to await an open demonstration by Dr. Wray or Professor Williams which will prove or excuse the assertions made by them. The profession has a right to expect it.

THE "PRACTICAL" EXAMINATIONS.

It has been said, by way of reproach too, that the practical examinations as at present conducted encroach upon the "theoretical." We may, perhaps, accept it as a fact that precisely similar questions have been asked in the room at Red Lion Square, as in the yard at Camden Town. It is difficult to imagine how it could be otherwise if both sections of examiners do their duty, and it is impossible by any instructions or regulations to prevent the occasional repetition of questions. Of course, there is a broad line which should distinguish the theoretical and practical examinations in the same subject. In the room questions on disease would be directed more to detail; in the yard questions would be confined more to the actual fact presented by the animal. In no case can any great hardship happen to a good student by the over-lapping of questions at the theoretical and practical examinations. To the middling student who has "passed in theory" it is perhaps hard to be detected at the practical by a question which trespasses upon the field he has just safely circumvented. This, however, will always be so long as two sets of examiners are employed to test one subject. When the *written* examination is adopted there will be no necessity to have one man to ask what a splint is in a room, and another to ask what it is in a yard The same examiner may then at one time demand in writing the nature, cause, and symptoms of spavin, and at another time, with the horse before him, ask for the practical diagnosis of ossific tarsal disease.

It is also said that the examiners in Class C sometimes ask a question which might have been put at the B examination. It is quite possible to believe that in connection with some lameness, the action of a muscle might be referred to, and it is difficult to understand how in operative surgery an examiner can keep clear of some very important anatomy.

As we have separate examiners it is of course right that they should, as far as may be, keep clear of each other's departments, but it is impossible to avoid some over-lapping.

One more complaint we may just mention—that the practical examiners act separately instead of conjointly, and thus defeat the aim of the Council in appointing two examiners at each subject. This is not a very serious fault, even if true, as otherwise it would apparently take twice as long to carry out the examination. In saying this we of course suppose that no single examiner would conduct the entire examination of any single student.

CASES AND ARTICLES.

DIAPHRAGMATIC HERNIA,

By Vety. Captain Powell, A.V.D.

The subject of the above was a bay gelding 11 years old, belonging to the Army Service Corps at this Station (Chatham), having joined the garrison from Aldershot, where it had gone through the Autumn Manœuvres in that district, about two months ago.

On the day previous to its demise, it had been employed on ordinary duties, and returned to barracks, the approach to which is up a very steep hill nearly half a kilomètre in length. An hour later, about 7 p.m., it was noticed to be off feed and showing signs of abdominal pain. Ordinary remedies were adopted by the Farrier in charge. On my visiting the patient, I found the following symptoms to be present:—Great abdominal pain attended by rolling when down, and lashing out with its hind legs when up. With difficulty the pulse was taken and found to be very rapid (80), small in volume, and imparting to the fingers a thrilling sensation. Respirations increased (30) and of a thoracic character, conjunctival membranes deeply injected. Flanks "tucked up" with considerable hyperidrosis, extremities very cold. On being placed in a well bedded-down loose box, the horse laid down carefully, groaning audibly. Shortly afterwards abdominal pain greatly increased, the animal rolled over on to its back, remaining in the position several minutes. It afterwards succeeded with difficulty in getting up on to its legs, and this was generally followed by a rush head foremost against the walls of the box, striking itself with considerable violence. These symptoms continued more or less until 7.30 the following morning, *i.e.* 12½ hours after admittance to treatment, when death ensued.

The autopsy made three hours after death, revealed a round opening, having thickened edges and about four inches in diameter, in the ligamentous portion of the diaphragm, between the foramen sinistrum and its muscular portion, through which the stomach (completely empty), spleen, and a large portion of the small intestines had passed into the thoracic cavity. The small intestines, possibly owing to strangulation, were black from congestion, and there were one or two patches of the same on the villous coat of the stomach. There were a few white patches about the size of a florin on the pleura-pulmonalis, but I did not observe any elsewhere. The other organs of the body were normal, and the body itself presented a well nourished state.

Believing the case to be one of very great interest I forwarded the specimen to Professor Fred. Smith at the Army Veterinary School at Aldershot who remarks "There is no shadow of doubt that the rupture is one of some little standing, as the edges are perfectly and completely healed."

On examining the history of the horse, I find it has a remarkably clean sheet, having only one entry (catarrh) against it, in a period of about six years service

During the time it has been in its present troop (3 months), it has been considered one of the most willing horses they possessed, and it was I presume, for this reason paired with a very bad jibber. The driver of the animal reports to me that it was always a very slow feeder, but invariably had a good appetite, and that it partook of its mid-day and morning feed on the day it was taken into treatment, in its usual manner.

"HOOSE" IN CALVES.

By J. C. James, Thornbury, Glo.

In the discussion which followed the reading of a paper on the above subject at the meeting of the Midland Counties' Veterinary Association, and reported in *The Record* for December 12th, a case is related by one of the speakers which appears somewhat paradoxical.

Capt. Russell is reported to have stated, "On a particular farm at Sleaford there were 40 calves which had never been turned out, but when they were ten months old the farmer lost 13 out of the 40 from hoose. The lungs of the animals were simply a solid mass of parasites." . . . .

I shall be much obliged to Capt. Russell if he will kindly tell us how those calves were fed. Did they receive any green food during the time they were kept in the yard? If so, then the problem is solved.

A similar case came under my notice some ten or twelve years ago. Sir George Jenkinson, of Eastwood Park, had lost a number of calves from hoose out of a large herd, and I was consulted as to the cause, treatment, and prevention. Besides prescribing for those already affected, and with the view to the prevention in the future, I advised that the calves which would be reared in the next or following years should be kept in the yards during the whole of the summer and autumn. My advice was acted on, and the young animals were never allowed out on pasture; but great was my chagrin when I was requested to visit and attend them, as they were as badly affected with hoose as those of the previous year. On inquiring into the feeding and management I found that they had been plentifully supplied with cut grass from an "infected" field. The mystery was at once explained. The embryo strongyli had been carried and supplied in the grass. Perhaps Capt. Russell's case was a similar one?

I have never known calves to have true hoose—with strongyli in the bronchial tubes—when kept in house or yard, and fed exclusively on dry food.

As regards our methods of treatment, there is no doubt that the intra-tracheal injection is the best, but treatment must be early, which is seldom the case, vide *Veterinary Journal* and *Veterinarian* for April, 1886, wherein I reported some interesting cases treated by intra-tracheal injection soon after its introduction into this country.

THE "PRACTICAL" EXAMINATIONS.

Admitting the searching character of the practical examination, it seems impossible to account for the great number of failures in this part of the final merely on account of its searching character alone. Many men who have undergone the ordeal are inclined to believe (and very justly, too, I think) that the theoretical examination may now be dispensed with entirely. This *so-called* practical examination of the present time, whilst embracing all the features of that of a year or so ago, includes also *Classes B and C (theoretical work)* in addition to operations. Consequently, the men who have been away seeing practice in order to meet the demands of a *higher practical examination* (pardon the misnomer) are quite out of the hunt; whilst those who stay at College after passing theory get through the practical examination easily enough, and, I may add, without having seen any practice whatever apart from the College. I can relate many instances which occurred during the last exam. held at Camden Town, where students had never seen a sick cow, dog, or sheep apart from the College. In fact one candidate, and a successful one too, asked a fellow-student to show him how to drench a cow, just prior to undergoing this terribly practical ordeal. Now the question is, How did this gentleman manage to pass his examination? I am not at all good at conundrums, otherwise I might be able to solve this problem; I could, however, hazard a guess were I so inclined, but prefer to leave the matter to your readers to work out for themselves during their leisure moments.

Again, it is only just to students that the Council of the Royal College of Veterinary Surgeons should state what percentage of marks entitles a candidate for examination to a "Pass—Great Credit, and Very Great Credit." Further, it seems to me that examiners should mark *every question*, whereas now a student is marked only when his examiner has finished with him, that is when operations are done marks are then put down by the examiner; after several lame horses have been examined the student is again marked; after the examiner has been asking questions for twenty minutes (say for convenience) the student is again marked; and so on with each examiner. Surely this system is not to be commended. Examiners are not infallible, they are human, like the rest of us, and we all know what tricks memory plays us at times. I would suggest that whilst one gentleman examines his colleague marks. This then would obviate any possibility of mistake. I would also like to point out the length of time students (especially at Camden Town) are in being examined. Many men have started early in the morning, and then had to go up again next day. This *unnecessary* length of time certainly tires a student out to say the least of it. In conclusion, I have to apologise for the length of this communication, and to vouch for the accuracy of the statements contained therein.

VERITAS.

PLEURO-PNEUMONIA.*

By J. M'FADYEAN, M.B., B.Sc., F.R.S.E., Royal Veterinary College, Edinburgh.

At the present time there is only one form of pneumonia occurring in cattle of which the Contagious Diseases (Animals) Act takes cognisance, but it is well known that both pleurisy and pneumonia may be set up in animals of the bovine species by other causes than the contagium of the disease termed contagious pleuro-pneumonia. When the clinical history of any given case is known there may be no difficulty in determining whether that case is one of contagious pleuro-pneumonia, but in the discharge of his duties under the Contagious Diseases (Animals) Act the veterinary surgeon has in many cases to decide whether the pneumonic lesions found after slaughter in the lungs of an animal whose clinical history is unknown are those of the contagious disease—in other words he has often to base his diagnosis solely on the anatomical characters of the lesions. To saddle veterinary inspectors with this duty is to assume that the lung lesions in contagious pleuro-pneumonia are absolutely pathognomonic--that there is no other known disease in which similar or indistinguishable alterations of lung structure are found. I propose to discuss whether that assumption in the present state of our knowledge is well founded. And in the first place I must crave indulgence while I describe the morbid anatomy of an ordinary case of contagious pleuro-pneumonia.

At the outset it is to be noted that in the great majority of cases there is, as the name expresses, a combination of pleurisy and pneumonia, but the association is by no means constant. There is abundant evidence to show that the primary lesion is situated in the lung substance, and that the implication of the pleura is a secondary process. The hypothetical germ of the disease appears to enter the lung with the inspired air, and, having penetrated into the lung tissue, it sets up in the area in which it multiplies changes that lead to the peculiar form of consolidation presently to be described. Until this consolidation has at some point advanced up to the surface of the lung the pleura remains healthy; but whenever the lesion, in the process of extension, reaches the superficial lobules at any part, the overlying pleura immediately becomes affected. Passing over for a moment the characters of this pleurisy, let us examine the alterations usually discovered in the lung substance.

The extent of lung affected is of course very variable; the lesions may involve the whole of one lung or the greater part of both, and the only limit in the upward direction is that caused by the fact that a certain amount of healthy lung tissue is necessary for the continuance of life. Theoretically we ought to expect to find all gradations of extent, down to the very smallest lesions, for in every case the disease must start from a point of microscopic dimensions. Nevertheless, even under the operation of

* A Paper read before the Lancashire Veterinary Medical Association, Dec. 16, 1891.

the Slaughter Order, very minute lesions are seldom detected. This may be due to the progress of the lesion being very slow during the first days or weeks of the period of incubation, and more rapid when once it is fairly started, but probably it is in part explainable by the fact that until the lesion has reached a certain extent and invaded a certain number of lobules it does not acquire those features which we regard as characteristic of the disease. In other words, we might find some thickening of a septum, some effusion into a single lobule, or a spot of disease in a bronchus, but we do not know any character that would absolutely stamp any one of these as being caused by the virus of pleuro-pneumonia. The very onset of the disease will not be recognisable until we discover the causal organism, and learn how to demonstrate its presence in the tissues.

When the consolidated part of a pleuro-pneumonic lesion is incised in an ordinary case of the disease, the cut surface presents a marbled appearance. This marbling is determined in the first place by the intersection of prominent pale yellow lines or bands, which correspond to the "veins" in a slab of marble. These, as everyone knows, are sections of the altered interlobular septa. Regarded from a little distance, the septa may appear homogeneous, but when closely inspected they show a variable structure. In some portions of the consolidated area the septa may be described as composed of a meshwork of delicate connective-tissue filaments saturated with a straw-coloured liquid, which exudes from them as soon as they are cut across. This liquid—the so-called "lymph" of inoculators—is in reality contained in the greatly distended lymphatic spaces and vessels of the septa; and in the latter, vessels which normally are quite invisible to the naked eye may have acquired the diameter of a crow quill. When the liquid escapes from the lymphatics it usually soon forms a soft coagulum. The apparent breadth of the septa varies greatly, but this is partly due to many of them being cut very obliquely, while others are cut straight across. Towards the margin of the consolidated area the thickening of the interlobular connective tissue shades off gradually, but it is usually traceable into the non-hepatised lung tissue.

The so-called lymph is not present in the liquid state in all the thickened septa. Some of the latter are beset, not with fluid lymph, but with coagulated fibrin, and these acquire in consequence a greater firmness and friability than are possessed by the septa in which the lymph is in the liquid state. Moreover, in some parts the septa may be still firmer and actually fibrous in appearance.

Turning, in the next place, to the lung parenchyma, we find that this presents alterations that form an essential part of the picture. The sections of pulmonary lobules cut in various directions appear as coloured islands surrounded by the pale septa, and if the consolidation is of any considerable extent these islands are not uniform in colour. The shades of colour commonly present are buff or yellow, light red or salmon-coloured, deeper red or flesh (muscle) coloured, and deep, dark red, like extravasated blood. The density of the parenchyma, like that of the interlobular tissue, is variable, and there is generally a gradual transition from hepatised to normal lung at the periphery of the solidified portions.

In the more solid central portions of the lesion the arteries and veins are often thrombotic, and the bronchi in the same area may be plugged with coagula of various sorts, and show obvious thickening of their walls and contraction of their lumen.

What, it may be asked, are the microscopic lesions that underlie these departures from the naked-eye appearance of a normal lung?

(1.) The interlobular septa. At the periphery of the affected part, where the first stage in the broadening of the interlobular septa is found, the rich network of lymphatic channels is seen to be distended with a fibrinous coagulum which is in general very poor in cells. The fibrin appears as a cloud of delicate threads and finely granular matter. For the most part the fibrin here seen is of *post-mortem* formation, the solid coagulum having been formed from the fluid lymph that escapes from the cut surface of the fresh lung. Although the fibrinous lymph within the lymph channels is, as already mentioned, poor in leucocytes, these are often numerous at the very margin of the interlobular septum, and I am inclined to think that such a small-celled infiltration is always prominent at the outset of the lesion in the interlobular connective tissue. The broader septa in the more solid part of the hepatised area also owe their increased thickness and firmness mainly to the coagulation of a fibrinous material in their enormously distended lymph channels. The granular character, and staining reactions may indicate that this fibrin is already in process of degeneration, and frequently it is being invaded from the margin of the septum by leucocytes and young fibro-blast cells. In the still firmer septa of old lesions the fibrin of the earlier stage has been largely removed, and its place has been taken by young connective tissue. All stages in the formation of this—from the round fibro-blast cells to the fibrillated tissue—may be met with in one field of the microscope.

(2.) Parenchyma or lobular tissue. When sections from the peripheral part of a pleuro-pneumonic lesion were examined microscopically, the lobules may be found to be almost normal although the connective tissue surrounding them already has its thickness notably increased through the above-described lymphatic distention; and this statement applies not only to the air vesicles and infundibula but also to the intralobular bronchi. But when the connective-tissue capsule of the lobule becomes greatly thickened the lobule must obviously suffer. Some of the fleshy yellow or pink lobules have been rendered airless (1) through the escape into their most peripheral air vesicles of a fibrinous material identical with that in the lymph spaces of the interlobular connective tissue, and (2) through compression of their more central air vesicles by this same fibrinous exudate in the peripheral part of the lobule and in the connective tissue around the lobule. If the distribution of the fibrinous exudate is not uniform throughout a lobule, then it is most abundant in the

peripheral air-cells. These are frequently filled with small fibrinous clots identical with the coagulum in the adjacent interlobular tissue, while the central parts of the lobules, including the bronchioles, are absolutely normal, save that they are slightly compressed. A most notable feature of the lesion in the lobules is that it is not at any time associated with marked distention of the pulmonary capillaries, such as is constant in the early stage of other forms of pneumonia. The fibrinous exudate in the air-cells may be of recent formation, or it may already have undergone hyaline or fatty degeneration.

But the alveolar contents are by no means always fibrinous in character. In many lobules the change is distinctly a catarrhal one, air vesicles being filled with round nucleated cells, apparently the progeny of the swollen and proliferating epithelium. This change may affect the lobular bronchi also. Sometimes the catarrhal proliferation is associated with a peculiar transformation of the alveolar epithelium, that having become distinctly columnar in character. The fact that catarrhal changes are common in contagious pleuro-pneumonia has been strongly insisted upon by several writers on the subject, notably by Dr. Gerald Yeo and Dr. Woodhead; and, indeed, it must be known to everyone who has paid any attention to the minute anatomy of the lesions.

In the dark-coloured areas which mark the seat of an infarction the air-cells as well as the septa are crammed with blood, and in old lesions the walls of the air vesicles are thickened by the formation of connective tissue.

The occurrence of catarrhal changes within the lobules, and affecting the terminal bronchioles, has already been mentioned, but similar changes are not uncommon in the larger bronchi running in the connective tissue of the lung. Throughout the area of consolidation the peribronchial lymphatics are distended with fibrinous lymph, but, in addition to that, the bronchial mucous membrane may show pronounced catarrhal changes. Dr. Yeo says, "I have never examined a lung affected with pleuro-pneumonia in which there was not a well marked and characteristic lesion of the bronchial tubes of the part most severely affected. No matter how small the focus of disease in the lung may be, or how little advanced a stage these morbid changes may have reached, there is always definite disease in the corresponding bronchus extending some distance along the tube, but more or less localised to the diseased neighbourhood." The passage quoted, coming as it does from an accomplished microscopist, and one who has studied with great care the morbid anatomy of pleuro-pneumonia, may serve to show the folly of concluding, as some have done, that the discovery of bronchitic changes in any case of pneumonia in the ox stamps the disease as something other than contagious pleuro-pneumonia.

The minute anatomy of the vascular lesions in pleuro-pneumonia may be dismissed in a few words. The lymphatic vessels around the artery and vein share in the engorgement with fibrinous lymph. This may be followed by a small-celled infiltration of the coats of the vessels, thickening and roughening of the intima, and thrombosis with partial or complete occlusion of the lumen.

It has already been mentioned that pleurisy is an exceedingly common but not absolutely constant accompaniment of the lung consolidation. Where the affection of the pleura is recent the free surface of the membrane is covered with a thicker or thinner layer of grayish tough lymph, and the pleural sac generally contains more or less of a turbid yellowish liquid with fibrinous coagula floating in it. In the uncomplicated disease this exudation is neither purulent nor putrid. Where the parietal and visceral pleura are not kept apart by the exhudation they become united by the layer of fibrinous lymph, and in process of time this lax union may be replaced by firm adhesion due to the formation of fibrous connective tissue.

The microscopic anatomy of the pleural lesions presents little that is special or interesting. The sub-pleural lymphatics are engorged with fibrinous lymph in the early stage of the process, and the layer of lymph coagulated on the surface of the membrane is generally rather poor in cellular elements. As soon as this layer is deposited, degenerative changes begin on it, and *pari passu* it becomes invaded from its deep aspect by leucocytes and fibro-blast cells. The solid fibrin is thus gradually removed, and young cicatricial tissue is substituted for it, and this, if time permit, may lead to the production of firm fibrous adhesions between the lung and the chest-wall.

The foregoing account of the lesions commonly found in contagious pleuro-pneumonia makes no pretensions to being complete or exhaustive. The omission of any reference to the ulterior alterations, such as necrosis, caseation, gangrene, etc., is deliberate and not an oversight, for the object has been to describe only such changes as are to be found in nearly every case of the disease, in order to be in a position to consider how far these changes, taken separately or in combination, are pathognomonic. But before taking up that question there is one other point that demands consideration, viz., the sequence of the lesions previously described. Incidental allusion has already been made to this, in expressing the opinion that the pleural affection ought to be regarded as secondary. But taking this for granted, one may ask, what is the order in point of time of the various lesions found in the lung substance? Dr. Yeo* as the result of his investigations came to the conclusion that the primary seat of the disease is in the bronchi, and he considers the sequence of the lesions to be as follows:

"1. Irritation of the mucous membrane of the smaller bronchi, probably by some infective material (specific virus).
"2. Chronic ulcerative bronchitis, localised to a few minute bronchi,
"3. Occlusion of the affected air-tubes.
"4. This produces such changes in the air-cells belonging to the affected tubes that the lobular parenchyma becomes solid.
"5. As the bronchial disease progresses, the walls

*Journal of the Royal Agricultural Society of England, vol. xiv., pt. 1.

of the air-tubes become thickened and infiltrated with the products of chronic inflammation.

"6. The peribronchial lymphatics are implicated by the extension of the infective process from the bronchus, and are soon filled with dense exudation.

"7. The block in the lymphatics of the broncho-vascular system impedes the flow of lymph from the corresponding territory.

"8. The tributary lymph-channels are thus mechanically engorged, and at the same time they are irritated by infective materials.

"9, The inflammation of all the coats of the air-tube gradually spreads towards the root of the lung. Thus we have a deep-seated cone of typical consolidations, traversed by numerous wide whitish lines, corresponding to the swollen interlobular connective tissue (marbling). In fact, the essential features of the disease are established."

Dr. Woodhead* arrived at somewhat different conclusions regarding the starting-point and progress of the lesions in the lung. He believes that the primary irritation is not confined to the mucous membrane of the smaller bronchi, but that it may directly or indirectly implicate the epithelium of the air vesicles, and set up catarrhal proliferation. He supposes that the virus passes from the air vesicles (and sometimes from the smaller bronchi) into the surrounding lymphatics, and that the peri-bronchial lymphatics are implicated by extension from the air vesicles as well as from the bronchi. The block in the lymphatics of the broncho-vascular system impedes the flow of lymph from the corresponding territory, and this is followed by the accumulation of fibrinous lymph in the air vesicles. This material finds its way into the smaller bronchi, and then to the neighbouring air vesicles, helping to set up a *catarrhal* pneumonic process by occlusion of some of the smaller bronchial tubes, and by direct irritation.

To determine the precise starting-point of the lesions of pleuro-pneumonia is, for the reason already indicated, difficult if not impossible; but there does not appear to me to be much difficulty in determining the manner in which the disease extends, and the order in which the various elements of the lung tissue become involved when once the disease has obtained a foothold. As regards this point my own observations have led me to conclusions much more in harmony with those of Dr. Woodhead than those of Dr. Yeo.

I think that it is highly probable that the initial lesion in pleuro-pneumonia is in the connective tissue at some part, and, however that may be, there is clear evidence in nearly every case of the disease that the affection spreads by way of the lymphatic vessels and spaces of the interlobular connective tissue (including the peri-bronchial and perivascular lymphatics), and that the implication of the bronchial and alveolar epithelium is a purely secondary process. Evidence in support of this is met with in every case in which the consolidation is extensive, for while one never finds either croupous or catarrhal lesions in lobules surrounded by healthy connective tissue, there is no difficulty in finding lobules that are absolutely or nearly normal although the connective tissue around them already exhibits marked distension of its lymphatic spaces. Moreover, where lobules are only partially consolidated their central part and the intra-lobular bronchi are always least affected. In short, the lobular disease has a centripetal mode of extension.

The catarrhal affection of the air-cells and bronchi is, in my opinion, always as much a secondary process as the changes in the walls of the blood-vessels, and my experience is entirely at variance with that of Dr. Yeo regarding the order in which the bronchial mucous membrane becomes involved. Not only may the intralobular bronchi be found perfectly normal in lobules whose peripheral vesicles are filled with a fibrinous exudate, but even in completely hepatised areas all the bronchi, large and small, may have their epithelium absolutely intact, even to the retention of the cilia.

Neither the nature nor the mode of extension of the lung lesions in pleuro-pneumonia is dependent upon anything special in the structure of the bovine lung, although such an opinion has been expressed by various writers on the subject. The peculiar features of the lesion are ascribable to the specific characters of the as yet undiscovered microbe of the disease, and no further evidence of this need be cited than that all the peculiar characters of the lung lesion are reproduced when the virus propagates in such widely different tissues as those of the mammary gland or the voluntary muscles. In all cases the primary and essential change is a distension of the lymphatic vessels and spaces of the part with fibrinous lymph that is comparatively poor in cellular elements. The lesion may be regarded as a peculiar form of inflammation, comparable to that of erysipelas, but differing from that in the slightness of the vascular disturbance, in the paucity of leucocytes in the exudation, and in the absence of all tendency to suppuration. Indeed, in great measure the lesion when fully established appears more of a lymphatic engorgement than an inflammation, but doubtless this engorgement is associated with a truly inflammatory process at some points in the lymphatic system of the part.

And now we arrive at the all important question, Are the before-described lung lesions pathognomonic of contagious pleuro-pneumonia, or are indistinguishable alterations sometimes produced in the lung of the ox by other forms of irritation? The following quotations may serve to show how divided opinion is on that subject.

Professor Williams in the first edition of his work on *Veterinary Medicine* thus describes the morbid anatomy of contagious pleuro-pneumonia:

"On opening the chest of an animal which has been slaughtered early in the disease, the visible changes are redness of the affected pleural surfaces; the substance of the lungs is red and congested; the redness and congestion being often in patches,

* Journal of Comparative Pathology and Therapeutics, vol. i.

whilst the lung tissue for some distance may be more or less healthy until another patch of more or less consolidated tissue is arrived at. The groups of consolidated lobules vary much in colour, some showing the deep redness of recent inflammation, whilst others present signs that the exudation is not only consolidated but is undergoing a gradual metamorphosis—softening—by which it is changed into a whitish turbid fluid, which flows from the cut surface, and to some extent capable of absorption. We have thus the red and the grey hepatisation, the red denoting the early, the grey the more advanced stages of the inflammation.

"Some have supposed that the very extensive exudation into the lung structure, and its marbled appearance, are indicative of some speciality in the inflammatory process: this is not, however, the case, for it is found that an ordinary pneumonia caused by cold, induces the same anatomical condition of the pulmonary parenchyma, the peculiar appearance being due to the anatomical fact that the lungs of horned cattle contain much connective tissue, and that the air cells are separated into groups by such connective tissue. 'In the ox and sheep the subserous, as well as the interlobular tissue, is very thick, the lobules being distinctly visible. This distinctive conformation explains the speciality of inflammatory diseases of the lungs in those animals.' —(Strangeways)."

Galtier in his *Traité des Maladies Contagieuses* (1st edition, p. 510) after giving a description of the lesions which is much too long for quotation here, says: "The pulmonary lesions of pleuro-pneumonia are not veritably pathognomonic; they resemble those of ordinary pleuro-pneumonia of the ox, but it seems that in the latter the infiltration and exudation are less pronounced and less generalised."

Pütz, in the corresponding German work,* regards this question as undecided and requiring further study. He quotes the following passage from Dr. Pauli: "There occurs in the ox a sporadic lung affection which, both in its external symptoms in the living animal and in its morbid anatomy, is similar to if not the same as contagious pleuro-pneumonia. Spinola's assertion that marbled hepatisation is exclusively the consequence of the organisation of the bovine lung, and not in itself a peculiarity of contagious pleuro-pneumonia, thus, like so many other statements by that experienced investigator, finds corroboration.

In their excellent text-book on the special pathology and therapeutics of the domesticated animals, Friedberger und Fröhner† describe a sporadic croupous pneumonia of the ox, and thus refer to its differential diagnosis: "The morbid anatomy of the two diseases is essentially different. In croupous pneumonia, on account of the acute course of the disease, the hepatised portions of lung are of the same age, colour, and character, and are thus completely similar; the interstitial system of lymphatic vessels is either not at all involved or only in a state of œdematous infiltration, or, if the process is very advanced, saturated with a thin fibrinous exudate with occasional white blood corpuscles. Pleuro-pneumonia, on the contrary, is characterised firstly by the different age and appearance of the hepatised areas, and secondly by the prominent participation of the interlobular lymphatic apparatus. The latter is shown by the extreme inflammation of the interstitial lymphatics (lymphangitis), with the formation of thrombi in the interior of the vessels and marked inflammatory infiltration of the interstitial connective tissue, leading to broadening of the latter; the pleura also is, in consequence of this, almost always implicated, in the form of an exudative fibrinous pleurisy."

Dr. Salmon, veterinary adviser to the Government of the United States, recently referred to this subject at a meeting of the United States Veterinary Medical Association, and a special interest attaches to his views regarding the differential diagnosis of contagious pleuro-pneumonia. He is reported to have said*:—"Those who have had experience with pleuro-pneumonia know how difficult it is to make a diagnosis when you have only one of these animals, and no way of tracing the history of that animal. You may find the condition of the lungs which resembles pleuro-pneumonia but which also resembles other diseases. We all know that pleuro-pneumonia produces a peculiar effect on the appearance of the affected lungs; but these peculiarities are also found in lungs which have received their irritation from other germs, and sometimes by other agents, so that it can hardly be claimed to-day that these symptoms are always those of contagious pleuro-pneumonia. Of course, when you take these symptoms of pleuro-pneumonia, and couple them with other characterics which we generally see, then we begin to have very positive evidence of the diagnosis."

Many similar quotations might be culled from text-books and journals, but those given will suffice to show that in the experience of some observers lesions identical with those constantly encountered in contagious pleuro-pneumonia are occasionally found in animals whose clinical history warrants the assertion that they never were exposed to the contagion of pleuro-pneumonia, and which, although placed in favourable circumstances, did not communicate the disease to other animals. On the other hand, they shew that others of equal experience have never met lesions identical with those of pleuro-pneumonia in animals whose clinical history proved that the disease was not due to contagion, or devoid of contagious properties.

The sharp conflict of opinion on this matter is probably due to two things; (1) to the not infrequent difficulty of tracing the contagion of pleuro-pneumonia, and (2) to loose notions regarding the morbid anatomy of that disease. Regarding the first of these nothing need be said, but the second point demands further consideration.

* Die Seuchen und Heerde-krankheiten der unserer Hausthiere, p. 84.

† Lehrbuch der speciellen Pathologie und Therapie, 1st Edition, p. 248.

* Journal of Comparative Medicine and Veterinary Archives, 1880, p. 664.

In most of the recorded cases of so-called sporadic pneumonia with lesions indistinguisable from those of the contagious malady, the authors lay special stress on the "marbled" character of the hepatised lung; but it is very important to observe that a certain form of marbling is in no way peculiar to the contagious pleuro-pneumonia, or even to the bovine species. A marbling due to mere increased prominence of the interlobular connective tissue of the lung is admittedly met with in sporadic pneumonia of the ox, and in some cases even in the horse and pig. But an essential feature in the marbling of contagious pleuro-pneumonia is the variety of colour presented by the ground-work or pulmonary parenchyma, and I agree with those who hold that we know of no other disease in which this form of marbling is produced. Moreover, I maintain that we know of no disease save contagious pleuro-pneumonia with lesions similar, as regards their nature and mode of extension, to those described in the preceding pages of this article.

Such statements as that quoted from Dr. Salmon are too vague to require any direct refutation, and a sufficient reason has already been given for discrediting the opinion formerly expressed by Professor Williams and others, that the peculiar hepatisation of pleuro-pneumonia is due to the anatomical features of the bovine lung.

The great importance of having clear notions regarding this question has been prominently brought to light by a recent conflict of opinion regarding the nature of certain lesions discovered in the lung of an American ox slaughtered at Deptford in April last.

The veterinary officer of the Board of Agriculture, whose duty it was to inspect the lungs of this ox, discovered in them lesions which he considered to be those of contagious pleuro-pneumonia; and when the suspected organs were forwarded to head-quarters, this opinion was confirmed by Professor Brown, and Messrs. Cope and Duguid. At this stage Mr. Wray, one of the American veterinary surgeons stationed in this country to see that United States cattle are not wrongly condemned for pleuro-pneumonia, dissented from the diagnosis made by the officers of the Board of Agriculture; and, having submitted portions of the diseased lung to Professor Williams, he obtained from the latter an opinion corroborating his own. The first public intimation of this was made through the medium of an agricultural paper in the following terms;—"Dr. Wray came to Edinburgh with portions of the affected lungs in order to have them examined by Principal Williams, of the New Veterinary College, and that expert had declared the disease to be broncho-pneumonia, a non-contagious disease which is quite distinct from the true pleuro contagiosa. So clear was the evidence in support of this declaration that Principal Williams expressed his readiness at any time to demonstrate to any body of veterinary practitioners the distinctive features of broncho-pneumonia detected in these affected lungs, as distinguished from the characteristic lesions of contagious pleuro."

Prior to this, portions of the lung had been submitted to Professor Walley and myself, and in each case the opinion was expressed that the lesions present were not distinguishable from those of contagious pleuro-pneumonia.

It need hardly be said that this extraordinary divergence of opinion immediately attracted much attention in agricultural as well as in veterinary circles, and everyone will admit that it was very desirable that better evidence than the mere publication of these contradictory views should be forthcoming in order to enable the profession and the public to judge where the error lay.

Professor Williams' declared readiness to submit the diseased lung to any body of veterinary practitioners bespoke complete confidence in his own opinion, and credit must be accorded to him for having conceived what was the proper method of settling the dispute. It is however, greatly to be regretted that he has not as yet fulfilled his promise. It is true that at a meeting of the Scottish Metropolitan Veterinary Medical Association he did exhibit in support of his opinion a micro-photograph from the lung of the Deptford ox, but the published report of the remarks made by the members at that meeting leaves no doubt that he failed to convince them that the disease was not contagious pleuro-pneumonia. Most people would think that this hesitancy on the part of the members of the Scottish Metropolitan Veterinary Medical Association to declare from the examination of a single micro-photograph that the Deptford ox had not been the subject of pleuro-pneumonia, was highly commendable; but Professor Williams appears to have thought otherwise, for he is reported to have exclaimed that if such evidence was not deemed sufficient they had better throw microscopic examination to the winds.

So far as the profession at large was concerned, the matter thus remained as doubtful as before; and hence, with a view to satisfying themselves, and at the same time providing evidence available to the whole profession, the members of the North of England Veterinary Medical Association determined to accept Professor Williams' offer already quoted. It was accordingly arranged to devote a meeting to the discussion of the subject, and Professor Williams was invited to attend and exhibit whatever specimens he thought necessary to convince the members of that Society that the Deptford ox had been free from pleuro-pneumonia. The author of this paper was invited to attend at the same time and lay before them what might be called the opposite side of the case. The meeting was held on the 20th of last month, but Professor Williams did not attend it. His absence is in a sense regrettable, but it is doubtful whether the outcome of the meeting would have been different had he been present. Professors Hunter and Bowhill, both members of Professor Williams' teaching staff, did attend, and exhibited micro-photographs to prove that the lesions present in the lung of the now famous ox were those of catarrhal pneumonia, and not of contagious pleuro-pneumonia. On the other hand, I submitted to the members a mixed series of preparations—naked eye, lantern, and microscopic—made from the disputed case and from a number of British cattle killed

under the Slaughter Order, while suffering from contagious pleuro-pneumonia. No one present (and this applies also to Professors Hunter and Bowhill) was able to distinguish in this mixed series of specimens those belonging to the Deptford ox; and when subsequently the preparations from this animal were specially pointed out, they were accepted by every member present as examples of contagious pleuro-pneumonia.

It will be gathered from this that Professor Williams' representatives entirely failed to convince the members of the North of England Society that one or two micro-photographs can afford more reliable evidence than a careful naked eye examination of the diseased lung in the differential diagnosis of pleuro-pneumonia. Indeed one might put this statement more strongly, and say, that these gentlemen furnished irresistible evidence that they were themselves unable to distinguish pleuro-pneumonia by its microscopic characters; for both identified as catarrhal pneumonia, sections from a typical pleuro-pneumonic lesion in the lung of a cow--one of four animals simultaneously affected in a small byre in Edinburgh.

But there remains to be mentioned additional evidence of great weight in support of the opinion that the Deptford ox was the subject of pleuro-pneumonia. On the occasion of a visit to the Continent during the past summer I personally submitted portions of the lungs of this animal to Professors Bang (Copenhagen), Schütz (Berlin), Johne (Dresden), Csokor (Vienna), Kitt (Munich) and Lüpke (Stuttgart), and each of these distinguished pathologists without hesitation declared that the lesions present were those of contagious pleuro-pneumonia (*Lungenseuche*).

At the close of the paper Professor M'FADYEAN exhibited a mixed series of specimens illustrating his views on the subject. These specimens included (1) large sections projected on a screen by means of an oxy-hydrogen magic-lantern, (2) photographs similarly projected to illustrate the naked-eye and microscopic characters of pleuro-pneumonic lesions, (3) smaller sections exhibited under the microscope, and (4) portions of lungs that had been preserved in spirit, to show the naked-eye appearances. These specimens, he informed the meeting, included some from the disputed Deptford case, and he invited any of the members to point out any specimen that in their opinion did not show the lesions of contagious pleuro-pneumonia. There was one point further to which he would like to allude. At the recent meeting of the North of England Society Mr. Bowhill, who, after a very short apprenticeship, styled himself a bacteriologist, exhibited a specimen from the lung of the Deptford ox showing, as he alleged, bacteria identical with those described by Professor Nocard in connection with an infectious form of broncho-pneumonia. These bacteria, Professor M'Fadyean affirmed, were common putrefactive organisms. The piece of lung before it reached Edinburgh was not fresh, and it contained not one but several species of bacteria. None of them had a distribution indicating a causal relationship to the lesions.

Mr. SMART, port inspector at Birkenhead, asked whether it was not the case that the micro-organism of pleuro-pneumonia had been discovered.

Mr. FAULKNER (Manchester) said that he for one felt convinced that the specimens Professor M'Fadyean had shown were affected with pleuro-pneumonia, and if they were not so affected it was impossible to say what else was wrong with them. He had never seen similar specimens to those shown in any other disease than pleuro-pneumonia.

Mr. REYNOLDS (Liverpool) said he did not think that the meeting should set itself up to say what was pleuro and what was not from what had been said that evening. He should be very chary in hazarding an opinion upon such small pieces of lung, even were they fresh. In order that any one might form a definite opinion either on contagious pleuro-pneumonia or ordinary bovine pneumonia, he ought to see the fresh lung, and the greater portion of it.

Mr. FAULKNER said that his position was that he had never seen any outbreaks of pleuro where the appearances did not tally with the specimens shown by Professor M'Fadyean.

Mr. HOPKIN (Manchester), while thanking the Professor for his highly instructive paper, deprecated making the matter a party question, or sitting in judgment between different members of the profession when they had only heard one side. He had seen some remarks in *The Record* lately, to the effect that it was hoped the Lancashire Association would speak out, and he thought such observations very unfair.

Mr. WHITTLE said he had no hesitation in saying that the specimens shown were affected with pleuro-pneumonia contagiosa.

Mr. LOCKE said it was difficult to give a decided opinion. One of the specimens certainly looked like pleuro, but another of them was doubtful especially on the outside of the lung. It had been stated that pus was found in the bronchi of the Deptford ox, and he asked whether in that case it was not possible for both diseases to be present in the same lung.

Mr. WOLSTENHOLME said that he had paid some attention to the microscopic lesions of the various forms of pneumonia in the human subject, and he should certainly accept the evidence placed upon the screen, and the slides exhibited as proving that the lesions were not examples of bronchial inflammation.

Professor M'FADYEAN in replying said that he desired in the first place to remove misconception from the minds of some of the speakers. He had never for a moment expected that the Association would pass a formal vote either one way or the other regarding the nature of the lesion present in the lung of the Deptford ox. At the same time, no matter what reservations any of them might make, he would claim that he had that evening exhibited portion of that lung along with others from known cases of contagious pleuro-pneumonia in home cattle, and that no one was able to pick out the Deptford specimens, or, when they were pointed out, indicate a point in which they differed from the others. While commending the caution displayed by Mr. Reynolds and others, he thought that the position taken up on this matter by Mr. Faulkner was perfectly logical. They formed their opinions regarding the lesions of contagious pleuro-pneumonia from cases where the clinical history proved that the disease was of that nature, and when they found such lesions in animals of which they could not ascertain the clinical history, they set them down to contagious disease. He desired to express his dissent from Mr. Hopkin's view that such questions were to be discussed as involving anything "personal." There was no personal element in the question. Even if Professor Williams had been his greatest friend he claimed the right to go before any body or association and support his own opinion, and he declined to be gagged because another person who might have a greater reputation differed from him.

With regard to the bacillus of pleuro-pneumonia, a

number of micro-organisms had been put forward at different times as the causal organisms of the disease, but it was universally accepted by all accredited bacteriologists that the causal connection of any organism with pleuro-pneumonia had not yet been proved. Indeed it was one of the essential features of contagious pleuro that all the customary methods of staining failed to show organisms when the disease was not complicated with some other lesion.

As to whether an animal might have both broncho-pneumonia and contagious pleuro-pneumonia at the same time, it was impossible to say that such might not be the case, for they could not suppose that an animal affected with broncho-pneumonia was protected against contracting pleuro-pneumonia. Possibly there might have been a small lesion of broncho-pneumonia in the piece of lung examined by Professor Williams.

Royal College of Veterinary Surgeons.

NEW MEMBERS OF THE PROFESSION.

At a meeting of the Court of Examiners held in London on and between December 14th and 18th, 1891. The following students from the Royal Veterinary College passed their Final Examination and were admitted Members of the Professiou: —

Mr. J. H. Taylor, Withington, Manchester
„ W. H. Williamson, Crouch Hill, N.
„ Geo. de Lisle Pinkler. Derby
„ T. F. Macdonald, M.B., Glasgow
*„ A. P. Case
„ G. D. Martin, Gravesend
„ Geo. C. Becket, Montreal, Canada.
*„ J. E. Fowler
„ M. Jacobs, Maida Vale, W.
„ A. Crofts, Beaford
„ J. E. Wallis, Leigh, Tonbridge
*„ E. H. Simmons
„ D. G. Davies, Gowerton, S. Wales
„ G A. Wickett, Redruth, Cornwall
*„ G. S. Thomas
„ C. W. Howard, Heston, Middlesex
„ J. F. Kemp, Edgbaston. Birmingham
*„ H. A. Sullivan
*„ J. Maguire
„ W. Wadesworth, Southport
„ J. H. Lockword, Cherrytree, Sheffield
„ W. J. Cade. Brandon Hill, Bristol
*„ E. W. Morris
„ A. A. Stevens, Durham
„ G. S. Harris, Camden Town, N.W.
„ F. W. Evans, Camden Town, N.W.

* These have not yet complied with the rules of the College

The following gentlemen passed their Second Examination.

Mr. B. P. Godfray
„ T. J. Hawkesworth
* „ W. C. Watts
„ R. S. Falshaw
„ A. B. Holland
„ J. P. Burr
„ J. W. Thomas
„ A. C. Oliver
Mr. F. Scott
† „ H. Reynolds
* „ S. Burton
„ J. S. Porrett
„ F. Mosedale
„ E. Ringer
„ E. Clode

The following gentlemen passed their First Examination.

Mr. F. Macarthur
„ E. Bell
„ J. W. Baxter
* „ W. Davies
„ L. Barnard
„ H. Sturge
„ G. W. Freer
* „ E. H. Fisher
† „ W. Fowle
„ F. R. Henton
Mr. C. M. Lawton
„ F. H. Pagson
„ P. A. H. Over
* „ H. Barnard
„ E. L. Stroud
„ P. G. Saunders
„ F. S, Stanley
* „ R. Burrell
† „ T. E. Jones
„ J. A. Craft

Marked thus * passed with great credit.
„ „ † „ „ with great credit.

ARTHUR W. HILL,
Secretary

At meetings of the Board of Examiners held in Edinburgh and Glasgow on and between December 17th and 24th, the following gentlemen passed their Final Examination and were admitted Members of the Royal College of Veterinary Surgeons.

GLASGOW VETERINARY COLLEGE—

Mr. James Bishop, Glasgow.
„ John Campbell, Rutherglen
„ W. Packmann Bury
„ R. Campbell Kirkcudbright
„ W. Marshall, Drummore, Wigtown
„ T. F. Renshaw
„ A. Hamilton, Glasgow
„ C. T. Holmes. Bishop Auckland
„ W. M. Williams, Groeslon, Carnarvon
„ L. Crook, Eccles

DICK COLLEGE—

Mr. H. Eve, Liverpool
„ J. Mitchell, Stranraer
„ W. H. McArthur, Mussoorie, India
„ P. McDonald, Edinburgh
„ M. Pottie, Paisley
„ G. F. Prickett, Birmingham
„ W. J. Richardson, Dublin
„ J. Tainsh, Perth
„ G. Thompson, Rhynie, Aberdeen
„ G. H. S. Jarrett, Glasnevin, Dublin

NEW COLLEGE—

Mr. A. W. Bland, Wrangel, Lincolshire
„ R. J. Bushnell, Abergele
„ M. J. Carroll, Limerick
„ J. Connochie, Ayton, Berwickshire
„ J. T. Clanchy, Charleville, Cork
„ A. J. Dalgleish, Newcastle
„ O. Ducksburg, Lancaster
„ J. Halliwell, Bolton
„ T. Lanchester, Bishop Auckland
„ J. Norbury, Altringham
„ R. Taylor, Leeke, Staffordshire
„ J. McL. Young, Dundee
„ W. C. Patrick, Perth
„ C. D. Wishart, Haddington

The following gentlemen passed their Second Examination:—

GLASGOW COLLEGE—

Mr. J. Pottie	Mr. W. McMurray
„ D. P. Harvey	„ J. Gillies
° „ J. McDougal	„ J. McKie
„ F. W. Thompson	

DICK COLLEGE—

Mr. Blackburn	Mr. L. P. Knight
° „ M. Dugdill	° „ J. W. Masheter
° „ T. J. Foulkes	„ W. Mills
„ E. R. Gibson	„ J. W. McIntosh
„ E. Hall	„ T. J. Nolan
„ J. A. Hepburn	„ J. Peddie
„ C. Hill	„ E. H. Pratt

NEW COLLEGE—

Mr. H. W. Deakin	Mr. R. T. Hutchinson
„ H. G. Hewitson	„ A. B. Tully

The following gentlemen passed their First Examination:—

GLASGOW COLLEGE—

Mr. D. McGeoch	Mr. A. S. Adams
„ D. Evans	„ W. L. Webster
° „ H. J. Maxfield	

DICK COLLEGE—

Mr. W. T. Aulton	Mr. D. B. Ritchie
„ T. J. Batty	„ D. Reid
„ W. Brown	„ J. D. Richardson
† „ A. Fletcher	° „ K. Roberts
° „ W. J. McConnell	„ A. Wilson
° „ H. E. Powell	

NEW COLLEGE—

Mr. M. Broomhead	° Mr. J. A. McGowan
„ J. W. Cowx	„ W. Rostron
„ S. Fenney	„ F. J. Taylor
„ A. Ferens	„ W. Wintle
° „ F. C. Fountain	„ J. H. Yates
„ A. J. McDonald	

Marked thus ° passed with great credit.
„ „ † „ „ very great credit.

R. RUTHERFORD, F.R.C.V.S.,
Secretary to Board of Examiners.

EXTRACTS AND NOTES.

MEDICAL EDUCATION.

The following extract from *The Lancet* applies to the sister profession, but contains much that may be valuable to us either as warning or example.

THE MATRICULATION.

"With the advent of the new year two of the most important changes that have been introduced by the General Medical Council since this body has been called into existence will come into effect, and will materially alter our present system of medical education. The one affects the preliminary and the other the professional education of the future medical student. Since October 1st, 1885, the preliminary examination which must be passed before registration, comprised (1) English Language, including Grammar and Composition; (2) Latin, including Grammar, Translation from specified authors, and Translation of easy Passages not taken from such authors; (3) Elements of Mathematics, comprising (*a*) Arithmetic, including Vulgar and Decimal Fractions, (*b*) Algebra, including Simple Equations; (*c*) Geometry, including the first book of Euclid; (4) Elementary Mechanics of Solids and Fluids, comprising the elements of Statics, Dynamics and Hydrostatics; (5) One of the following optional subjects—Greek, French, German, Italian, any other Modern Language, Logic, Botany, Zoology, and Elementary Chemistry. The student could pass in any one or more of these subjects, so that frequently he only passed in the necessary subjects by submitting himself again and again for examination. By dint of taking the subjects separately almost anyone could be ensured against failure. But the regulations passed by the General Medical Council in June, 1890 and 1891, and which will come into force on January 1st, 1892, for every student who has not passed a part of any preliminary examination at the end of the year, will make great changes in the preliminary examination. In the first place, the whole of the subjects must be passed at the same time; and, in the next place, Books I., II., and III. of Euclid, or their subject-matter, will be required instead of one book only; whilst Elementary Mechanics is dropped altogether. The sciences are also omitted from the list of optional subjects, so that Botany, Zoology, and Elementary Chemistry no longer appear in the preliminary list. The subjects of the preliminary examination are now approximated to those taught in every good school, and should be mastered in the regular routine of a good school education. The sciences are passed on to the professional examinations. Curiously enough, mechanics is not included in this scientific curriculum, so that a boy will now have to be taught the physics of heat, light, and electricity, without his having necessarily been made acquainted with the elementary laws which govern matter and force. Surely mechanics and physics should be together included and insisted on at the first scientific examination of the student.

THE PROFESSIONAL.

The General Medical Council in June, 1890, resolved that a period of five years, instead of four, as at present, should be devoted to professional studies after registration, that this regulation should come into force on Jan. 1st, 1892, and that the fifth year should be a clinical one. The resolution stands thus: "The fifth year should be devoted to clinical work at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised by any of the medical authorities mentioned in Schedule A of the Medical Act, 1858, provided that of this year six months may be passed as a pupil to a registered practitioner holding a public appointment, or possessing such opportunities of imparting practical knowledge as shall be satisfactory to the

medical authorities." The revised scheme of the Conjoint Examining Board in England has now passed the two Royal Colleges, and the option of spending six months of the final year as a pupil to a registered practitioner has been struck out. The teaching authorities in London, and the direct representatives of the profession in the General Medical Council, evidently do not agree as to the advantages of a six months' pupilage to a general practitioner. The list of subjects of professional study and examination which will satisfy the General Medical Council is as follows:—(1) Physics; (2) Chemistry; (3) Elementary Biology; (4) Anatomy; (5) Physiology: (6) Materia Medica and Pharmacy; (7) Pathology; (8) Therapeutics; (9) Medicine, including Medical Anatomy and Clinical Medicine; (10) Midwifery, including Diseases peculiar to Women and to New-born Children; (11) Surgery, including Surgical Anatomy and Clinical Surgery; (12) Theory and Practice of Vaccination; (13) Forensic Medicine; (14) Hygiene; (15) Mental Diseases. Later recommendations still further define requisite studies, especially in a practical direction. Practically, the five years' curriculum is in vogue at the Universities, as at all of them one year's study is devoted to the preliminary sciences, so that this regulation really compels the licensing corporations to follow the example of the Universities. The scheme of the Conjoint Board in England shows how this can be effected, although in some respects it is only done in a half-hearted manner, and with halting steps. The provisions for meeting this five years' curriculum on the part of the other licensing bodies have not reached us; but as the regulation is compulsory throughout England, Scotland, and Ireland, the time has come when every licensing authority must draft its scheme. The Conjoint Examining Board in England, as an experiment, will adopt the plan now passed by the two Royal Colleges, and it has been settled that the examinations will be four in number, and that they will be rearranged thus:—(1) Chemistry and Physics, Elementary Biology, Practical Pharmacy (or at the third examination), and any of these may be studied before registration, and Elementary Human Anatomy; (2) Human Anatomy and Physiology, after the expiration of two winter sessions and one summer session; (3) Medicine (including Medical Anatomy, Pathology, Pharmacology, Pharmacy, Therapeutics, Forensic Medicine, and Public Health), Surgery (including Pathology, Surgical Anatomy, and Midwifery and Diseases peculiar to Women—but this latter subject may be postponed until the next or final examination). This examination cannot be passed until four years have expired from the date of registration and the end of the fifth year the candidate will be examined in Clinical Medicine and Clinical Surgery and in Midwifery and Gynæcology, unless he has passed in this latter subject at the previous examination. There are many objections to this scheme, but as it is candidly described by its authors as only an experiment, we shall not criticise it at present, but shall watch its working with great interest."

Overcrowding.

The following from *The North British Agriculturalist* does not look as if Scotland were overstocked:—

"A Veterinary Surgeon Wanted.—A large and representative meeting of farmers was held in Stonehaven on Friday—Mr. John Hart, factor, Cowie, in the chair—to consider what steps should be taken to secure the services of a first-class veterinary surgeon for the Stonehaven district. A representative committee was formed to raise subscriptions to form a premium as an inducement for a first-class man to come forward."

ARMY VETERINARY DEPARTMENT.

Vet.-Lieut. H. M. Maxwell has been posted to Newbridge for duty on return from India.

Vet.-Lieut. J. G. O'Donel has been posted to Cahir for duty with the 15th Hussars on return from India.

Vet.-Lieut. E. Wilkinson, R.A., Ipswich, will embark on January 3rd for a tour of Service in South Africa, to relieve Vet.-Major R. Rowe, who returns to England.

Vet.-Lieut. W. J. Tatam is under orders to embark in February for a tour of Service in India.

Vet.-Lieut. A. F. Appleton has rejoined the 6th Dragoons at Brighton on return from sick leave.

YEOMANRY CAVALRY.

Staffordshire (Queen's Own Royal Regt.)—Vet.-Lieut. G. H. Watkins resigns his commission. Dated 3rd December, 1891.

Buckinghamshire (Royal Bucks Hussars).—Vet.-Lieut. H. G. Lepper to be Vet.-Capt.

J. Caldecott, Esq., late Army Veterinary Department, died at Knutsford, Cheshire, on December 25th, 1891.

CORRESPONDENCE.

EXEMPTION FROM JURIES.

DEAR SIR,

Having read a copy of the proposed New Charter, I find there is no suggestion that our profession should be exempt from serving on juries. I am convinced that ninety-five per cent. of country practitioners would be very glad to be put on an equal footing, in this respect, with the medical profession.—Yours faithfully,

A NORTH YORKSHIRE V.S.

COMMUNICATIONS, BOOKS, AND PAPERS RECEIVED:—Vet-Col. F. Duck, Vet. Capt. B. A. W. Powell, Messrs. J. C. James, A. S. Hitchcock, A. J. Hawke. "Veritas," A North Yorkshire V.S.

We shall be obliged by early intelligence of all matters worth bringing under the notice of the profession, and thankful to any friends who may send us cuttings from local papers, containing facts of interest.

Communications for the Editor to be addressed 20 Fulham Road, S.W.